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EDITORIAL

THE great success which has attended the application of photography to the determination of the positions and movements of stars may well stimulate geologists to attempt a similar application to earth movements. It is a not uncommon belief among mountaineers that peaks which were formerly not visible from certain points of view have recently come into sight, and conversely that points formerly in view have disappeared from sight. There is nothing incredible in this if warping is in active progress, and it would seem worthy of being put to the test of exact observation. It would not be difficult to take photographic panoramas from selected points of view, and to record with precision the positions of the camera, so that views could be taken from exactly the same points at subsequent dates. A comparison of such views would serve to show whether any appreciable warping of the crust is in progress or not. The effect of degradation on the one hand, and of snow accumulation, on the other, could easily be eliminated, and the influence of refraction might be avoided by taking the photographs in precisely similar conditions of atmosphere and light, or the proper correction could be made. As this method is probably applicable only to serrate alpine tracts, it is to be hoped that some of the geologists of those regions will interest themselves so far as to take and duly register a first series of photographs so that comparison may be made at some future time.

T. C. C.

THE doctrine of alternate quiesence and readjustment of the crust of the earth serves such a radical function in the interpretation of ancient peneplains, sea-shelves, and epicontinental seas, and in the elucidation of expansional, repressional, and provincial epochs of life evolution, that a precise conception of what is understood by quiescence and readjustment may aid in the removal of doubts and objections, since some of these seem to be based on a rather too rigid and literal interpretation of the terms quiescence and readjustment and their synonyms. Like most terms which relate to the mutual relations of the sea and the land, or of the continental platforms and the abysmal basins, the term quiescent has a merely relative meaning. It does not necessarily signify an absence of absolute movement toward the center of the earth, but simply an absence of *differential* movement relative to other portions of the crust. If the whole crust sinks toward the earth's center at an equal rate in all its parts, the relations of the continental platforms and the abysmal basins remain essentially undisturbed and may be said to be quiescent. Such a shrinkage may theoretically reduce the capacities of the ocean basins just as it reduces the whole surface of the sphere, and this reduction of basin capacity may cause the sea to overlap the margin of the land in some degree. But this incursion of the sea, would, if appreciable, be justly regarded as only an incident of the quiescent stage. It would indeed be only one of several factors involved in that transgression of the sea which is so characteristic of quiescent stages. It is only when such a common sinking of the crust toward the center develops *differential* stresses of such magnitude as to require a notable warping, crumpling, or faulting of the crust that the relations of the continental platforms to the abysmal basins are seriously disturbed and the quiescent stage is replaced by one of readjustment. It is perhaps even necessary to regard such a common centripetal movement during the quiescent period as a necessary antecedent of the period of readjustment, for such a movement is perhaps necessary to develop the differential stresses out of which the readjustment springs. All objections therefore to the doctrine of periodic quiescence which are based upon the conception of the absence of centripetal motion should be set aside as based upon misconception. The only valid theoretical objections are those which apply to the conception of periods of *concordant* centripetal movement alternating with periods of *discordant* centripetal movement. The former are quiescent periods so far as the relations of platforms and basins are concerned, the latter are periods of readjustment. The dynamical conception involved in this view is somewhat radically different from that involved in the literal conception of quiescent periods as periods of no crustal movement at all.

In the accumulation of the general stresses which issue in general readjustments, local stresses of special intensity must almost necessarily be developed and these may reach such a degree of intensity as to lead to local readjustments. These local readjustments may result in the distribution of the stresses over wider areas, and these wider areas may in time yield and transmit the stresses to still broader fields until the stresses become general and reach such a degree of intensity as to issue in a general readjustment. Local readjustments in the form of local warpings and faultings may be incidents of the general quiescent stages, and like them may be essential antecedents of general readjustments involving the formation of mountain systems and similar pronounced phenomena.

T. C. C.

THE DUPLICATION OF GEOLOGIC FORMATION NAMES

THE custom of giving more or less local geographic names to geologic subdivisions has become so universal that we are even now duplicating the use of such names to a considerable extent. Geological literature is of too great bulk for the working geologist to attempt to ascertain whether or not names which he proposes to use have been preoccupied. To illustrate what the present system is leading to a few instances of some prominence will be cited.

In 1883 Hague described, in a report of the United States Geological Survey the Eureka quartzite, a subdivision of the Silurian in the Eureka district, Nevada. In 1891 Simonds and

Hopkins, in a report of the Arkansas Geological Survey, used the name Eureka shale for a supposed Devonian horizon; while in 1898 Haworth, in a report of the Kansas Geological Survey, proposes the name Eureka limestone as a subdivision of the Coal Measures.

In 1879 Peale, in the Eleventh Annual Report of the United States Geological and Geographical Survey of the Territories, employed the term Cache Valley group for a subdivision of the Pleistocene of Utah. Becker described in 1888 the Cache Lake beds of California, in Monograph XIII of the United States Geological Survey, and referred them to the Tertiary. In 1896 G. M. Dawson, in a report of the Canada Geological Survey, uses the name Cache Creek formation for a horizon of the Carboniferous to include strata described by Selwyn in 1872 as Upper and Lower Cache Creek beds.

In 1842–1846 Emmons, Vanuxem and Mather employed the term Erie division as a subdivision of the New York system. In the Ohio Geological Survey reports the Erie clay was used as a subdivision of the Pleistocene, and Erie shale was referred both to the Carboniferous and Devonian. In 1875 Lesley described, in a report of the Pennsylvania Geological Survey, the Erie shale, which he referred to the Silurian. In 1898 Haworth described the Erie limestone of the Coal Measures of Kansas. The above references are given merely to illustrate the confusion that is likely to arise from the use of new geographic terms if the literature is not carefully examined for previous use.

For the past eighteen months the writer has been engaged in preparing a card catalogue of geologic formation names, during such time as could be taken from other office and field work. This catalogue has already assumed considerable proportions, and is now being consulted by those geologists who are aware that such a work is being prosecuted. While preparing the annual bibliography of geological literature for 1898 the writer has found several instances of duplication of names that have become well established in geological nomenclature. It will probably be a year or more before this catalogue can be published, and, in the meantime, to assist in avoiding such duplication, the writer offers to furnish geologists, who will correspond with him, such information as he possesses, regarding names which they propose to use as formation names.

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